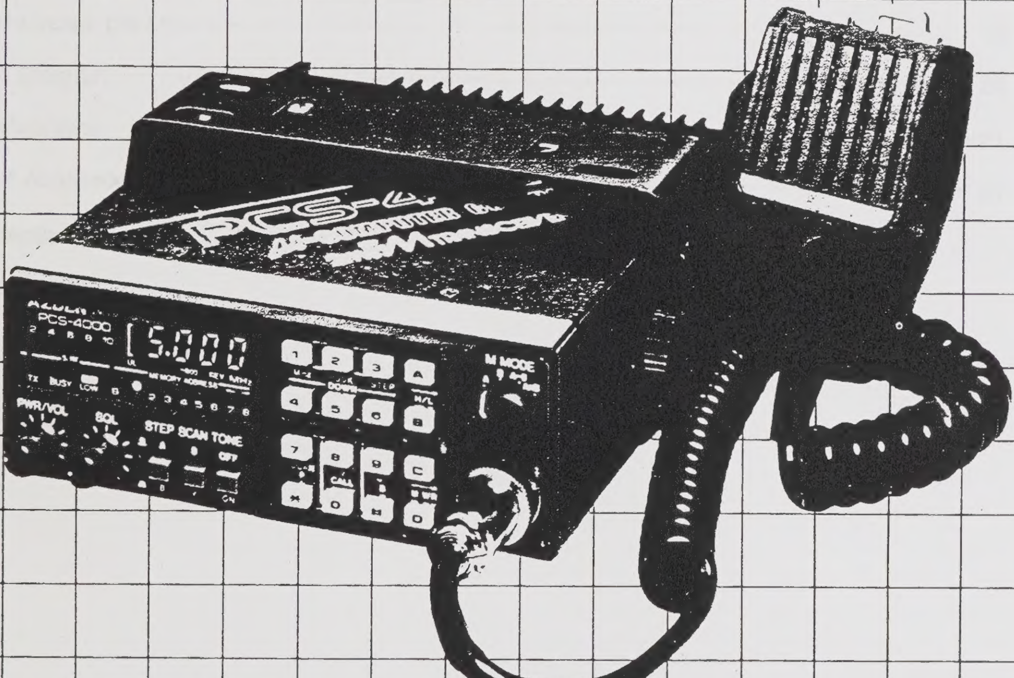
AZDEN

2m FM TRANSCEIVER

PCS-4000

INSTRUCTION MANUAL



JAPAN PIEZO CO., LTD.

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※This manual was prepared mainly for U.S.A. model.

MAJOR FEATURES

1. C-MOS Microcomputer Control

The built-in microcomputer makes scanning for Busy and Vacant channels possible. Channel operations are all computer-controlled. Once stored in memories, frequencies are retained even when the power is turned off. A long life, rechargeable Ni-Cd battery is used as a memory back-up power supply.

2. Feather touch tuning control key board

All tuning operations are conducted by simply pushing the key(s) which always returns acknowledge tone electronically synthesized when pushed. All keys are illuminated to allow easy access even in the darkness, thus increasing operationability.

3. Two bank, 16 memory channels

Each bank contains 8 memories, so frequencies(channels) up to 16 can be stored, offering advantage for club use. The microcomputer scans each or both banks to find a busy or a vacant channel automatically according to the instructions from the SCAN and M MODE switches. Erasing and rewriting are easily performed.

4. Operating frequency is always displayed

While transmitting, the shifted frequency as determined by the microcomputer is displayed. A microphone having 3 different functions is provided as a standard accessory.
An easy-to-handle palm-control microphone performs the functions of Push-to-Talk, Frequency UP and DOWN and Memory 1A Calling.

5. Green display employed

Frequency display uses 4 digit green LED for optimum visibility under variable ambient light condition and indicates operation frequency. The digital display prevents reading errors.

6. Programmable band scanning

Any two bands arbitrarily selected between the lower and upper limit of the frequency range of this unit can be scanned separately or sequentially by using P SCAN function of the keyboard.

7. One touch priority channel access

Each M1 address on the A & B memory banks allows direct access, so two channels, that may be the channels used most frequently, can be selected by simply touching the M1-A or M1-B key regardless of a current mode of operation or any other operating positions of key and switches.

8. Standard or non-standard frequency shift operations

The microcomputer allows the standard ± 600kHz shift operations with the SHIFT key pushed for duplex operation. Furthermore, the computer also allows non standard any frequency shift operations by utilizing its memory functions and "AxB" mode in accordance with the program installed.

9. Memory address indicator

The memory address indicator consisting of a memory bank indicator LED and 8 address indicator LEDs display the channel(s) being used.

10. Selectable 5 or 10kHz channel spacing

Frequency step of 5 or 10kHz(12.5kHz or 25kHz in European Version) is selected with the STEP switch provided on the front panel.

11. 25W/5W switchable power output

Hi/Low power switch selects either 25W or 5W transmit power output, thus minimizing possible interference or saving power consumption.

12. Optional tone call unit available

A space for mounting the optional tone call unit is provided inside the unit for your additional tone call operation. The TONE switch used for this purpose has been already mounted on the front panel of the unit.

CAUTIONS BEFORE USE

Before connecting the unit to a power supply, check that the antenna is securely mounted on your car. Check the external antenna system for short-circuit using an ohmmeter, and then firmly screw the antenna plug into the antenna connector on the rear panel of the unit.

* Check that the antenna cable used is of 50-ohm impedance. We recommend you to use a RG-58/U or RG-8/U or equivalent coaxial cable for the antenna connection.

★Rated voltage of the unit is 13.8V

Be careful not to connect the unit to an improper power source, as this may cause damage. For mobile use connect the power cable directly to the battery, being careful to observe the proper polarity.

★Check that power supply voltage is 12 to 14V and each lead wire is connected to correct polarity.

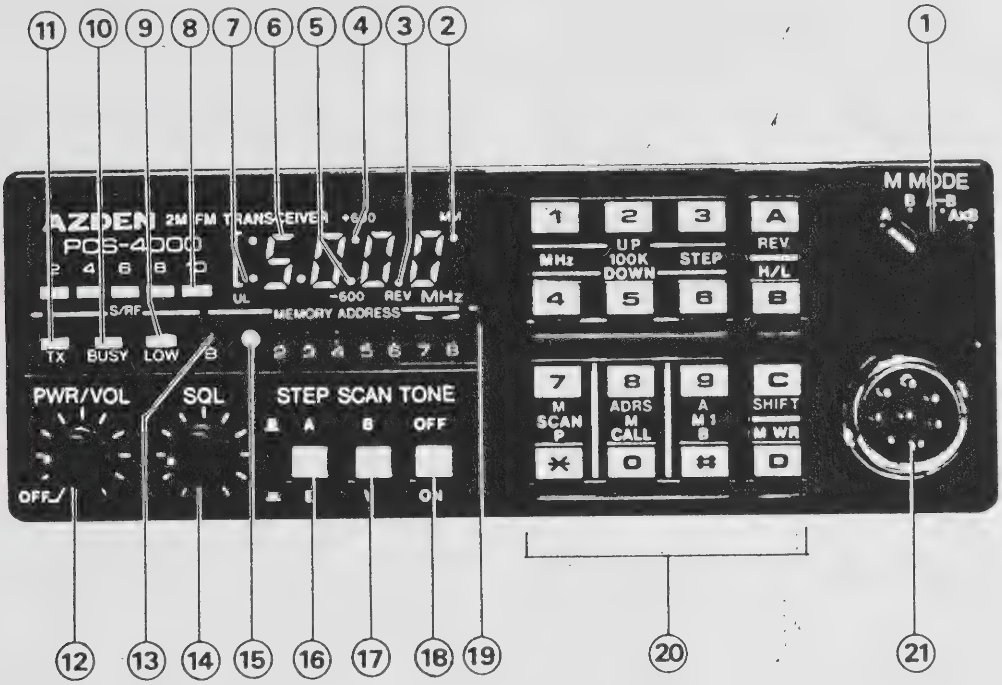
The red lead is for positive + and the black lead for negative −, with maximum rating of 13.8V ± 15%. The unit designed for negative ground circuits only.

★Be sure the unit is properly located

When using this transceiver as a fixed station, it should not be located in a place directly exposed to sunlight or with excessively high humidity.

When using this unit as a mobile station, avoid locating it where it comes in direct contact with the air flow from the vehicle heater. If a vehicle is parked for a long period under the hot sun, the inside temperature becomes very high. Do not start transmitting until the temperature lowers. Since this unit is to be grounded with the negative terminal, it must not be used in a vehicle that is grounded with the positive terminal without taking proper measures for insulation.

CONTROLS AND SWITCHES AND THEIR FUNCTIONS



(1) Memory Mode Switch (M MODE)
There are two memory banks (A & B) inside the unit and these memories can be used in four ways as shown below:

a. With the M MODE switch placed in the "A" position, the "A" memory bank is selected. The "A" memory bank has eight memories and any operating frequencies up to eight will be stored in the memories.

b. When the switch is placed in the "B" position, the "B" memory bank is selected with the "B" bank memory LED(13) turned on. The "B" bank has also eight memories and allows 8 operating frequencies to be stored.

c. With the switch placed in the "A-B" position, both "A" and "B" memory banks are selected sequentially, so stations(frequencies) up to 16 can be scanned automatically or selected if they have been stored previously.

d. With the switch placed in the "AxB" position, the "A" bank memory is selected during receive mode of operation and the "B" bank memory is selected during transmit mode. Accordingly, if you store a frequency on the "A" bank memory and another frequency(offset frequency you want to operate) on the same address memory of the "B" bank, reception is made with the frequency stored in the "A" bank memory and the transmission is made with the frequency stored in the "B" bank memory. Namely, communication will be made with any non-standard frequency offset if the switch is placed in the "AxB" position.

(2) Memory Mode Indicator (MM)

This serves to indicate that the unit is operating under Memory Mode(with SCAN-M/P, M-ADRS/CALL, M1-A/B button pushed). For further details, see the section entitled "Details of Keyboard"

(3) Reverse Mode Indicator (REV)

This serves to indicate that the unit is operating under Reverse Mode with the REV key pushed. For further details, refer to the section entitled "Details of Keyboard".

(4) +600kHz Indicator (+600)

This serves to indicates that the transmit frequency is 600kHz higher than the receive frequency in transmission. With the indicator turned on, the Frequency Display shows a frequency equal to "receive frequency plus 600kHz" when the Push-to-Talk(PTT) switch is depressed.

(5) −600kHz Indicator (−600)

This serves to indicate that the transmit frequency is 600kHz lower than the receive frequency in transmission. With the indicator turned on,the Frequency Display shows a frequency equal to " receive frequency−600kHz" when the PTT switch is depressed.

(6) Frequency Indicator

This indicator displays the lower four digits of transmit or receive frequency on large LEDs. For example, 5.000 stands for 145.000MHz.

(7) Unlock Indicator (UL)

This indicator lights up when the PLL circuit which synthesizes frequencies is not locked. With the indicator lit up, all transmit and receive operations are disabled to prevent illegal frequency generation or causing possible interference to other parties.

The UL indicator may light up for a short time immediately after the power is turned on, or after a channel change, because the PLL circuit requires a brief time period to be locked. So this intermittent lighting operation is normal. However, where will be some troubles if the Indicator remains to light up for an extended period of time.

(8) Signal Indicator (S/RF)

This indicator displays the input signal strength during reception or a relative power output during transmission, using five LEDs. The indicating level will be affected by the SWR of the antenna system used, therefore, 25W output does not necessarily mean that all five LEDs must be illuminated.

(9) Low Power Indicator (LOW)

This indicator, when turned on, indicates that the low transmit power of 5W is selected. On the other hand, the indicator turned off indicates that the high transmit power of 25W is selected.

(10) Busy Indicator (BUSY)

This indicator lights up when a station is received, thus indicating that the channel is in use.

(11) Transmit Indicator (TX)

This indicator lights up when the PTT switch is depressed, thus indicating that your message is being transmitted.

(12) Power On-Off/Volume Control (PWR/VOL)

When the control knob is placed in the OFF (fully counterclockwise) postion, the power is turned off. Rotating the knob clockwise will turn the power on, and further rotation will increase the sound volume from the built-in speaker.

(13) "B" Bank Memory Indicator (B)

This indicator, when turned on, indicates that the memory "B" bank is being selected.

(14) Squelch Control (SQL)

This control is used to eliminate annoying background noise when no signal is present. To adjust the Squelch control properly during reception, first turn the knob counterclockwise until background noise is heard. Then rotate the control slowly clockwise until background noise just disappears. At this point, the receiver will be relatively quiet under no signal condition, but an incoming signal will overcome the squelch action and be heard. Since this control is variable it can be used to

provide varying degrees of sensitivity to incoming signals. As the control is advanced from the extreme counterclockwise position, the squelch action is progressively increased and stronger signals are needed to overcome it. To receive extremely weak signals or to disable the squelch circuit, simply turn the control fully counterclockwise. The squelch control also decides scan stop sensitivity. So stations may be properly skipped by adjusting the squelch control knob during scanning operation.

(15) Memory Address Indicator (1-8)

This unit has two memory banks, each of which has eight memories. The memory adress indicator shows which address of the memory (channel or station frequency) is being used in the memory mode of operation. For selection of the memory banks, refer to "Memory Mode Switch".

For example, when the memory address "1" on the memory "A" bank is called up by M1-A key, the address indicator "1" lights up in addition to the memory address last used.

While transmitting, for example, through a channel stored in the memory address "1", only the memory address indicator "1" is lit up. For further details, refer to "Details of Keyboard".

(16) Scan Step Switch (STEP)

This switch sets the frequency spacing by which frequency is scanned up or down. With the switch placed in the released out (A) position, the scan step is set to 5kHz (12.5kHz for European version) and with the depressed (B) position 10kHz (25kHz for European).

(17) Scan Mode Switch (B,V)

With the switch placed in the released out (B) position, scanning is carried out over the channels determined by the keyboard switches (SCAN M, P) and the M MODE switch. When an input signal higher than the squelch level determined by the SQL control is received, the scanning stops automatically at the channel for approx. 5 sec, and then resumes scanning automatically. To receive the channel for more than 5 sec, push one of 1, 2, 3, 4, 5 and 6 keys.

When the switch is placed in depressed (V) position, the scanning is carried out but it skips over busy channels and automatically stops at the first vacant channel encountered. Once a signal enters the vacant channel, the scanning is resumed until the next vacant channel is encountered.

(18) Tone Switch (TONE)

This switch is used to actuates an optional tone encoder if it is mounted inside the unit. Usually place the switch in the OFF position.

(19) Programmable Scan Mode Mark

This indicates programmable scan is carried out between the frequencies stored in M7 and M8 on either memory A and B banks.

(20) Keyboard Switches

The keyboard switches are used to select various operation modes programmed inside the microcomputer.

All the keys are illuminated for easy location in darkness. Refer to "Details of Keyboard".

(21) Control Microphone Connector

This is used to connect the control microphone supplied with the unit. When connecting the microphone plug, do not attempt to force the plug onto the pins, it will slip on easily when the connector is properly aligned up. For detail of the microphone, refer to page15.

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※This manual was prepared mainly for U. S. A. model.

MAJOR FEATURES

★ Control unit is detachable from transceiver unit

This makes it possible to use the control unit on the dashboard for mobile operation, so that the unit may be manipulated more easily while driving. The main unit may then be removed to a more convenient place.

★ C-MOS microcomputer control

The built-in microcomputer makes scanning for Busy and Vacant channels possible. Channel operations are all computer-controlled. Once stored in memory, a frequency is retained even when power is turned off. The battery used is of a chargeable type.

★ Actual frequency is always displayed

While transmitting, the shifted frequency as determined by the microcomputer is displayed. A microphone having six different functions is provided as a standard accessory. An easy-to-handle palm-control microphone performs the functions of Volume Control, Channel Lock, Memory Channel 1 Call, Push-to-Talk, Frequency UP and Frequency DOWN.

★ Eight memory channels

Up to 8 channels from among 1600 channels can be stored, offering advantage for club use. Erasing and rewriting are easily performed.

★ Illuminated dial

Frequency display uses green LEDs for optimum visibility under variable ambient light conditions.

★ All digital display

The Digital Display prevents reading errors. The S/RF meter is also digital. LEDs indicate the memory channel being used and repeater offset status.

★ Programmable band scan

The lower and upper limits of the band scan range can be set as desired; the full band or any unbroken segment can thus be scanned.

★ Keyboard actuation is accompanied by audible tone

An electronically synthesized tone indicates data entry into the microcomputer.

★ Selectable 5 or 10 kHz increments

Frequency steps of 5 or 10 kHz may be selected via a front-panel switch.

CAUTIONS BEFORE USE

Before connecting to a power supply, check that the antenna is securely connected. Check the outside antenna circuit for short-circuiting using an ohmmeter. Ensure that it is not short-circuited, and then firmly screw it into the connector on the rear side of the unit. (See page 11)

★ Check that the cable used is of 50-ohm impedance

We recommend RG-58/U or RG-8/U or equivalent cable for the antenna circuit.

★ Rated voltage of the unit is 13.8V

Be careful not to connect the unit to an improper power source, as this may cause damage. For mobile use connect the power cable directly to the battery, being careful to observe the proper polarity.

★ Check that power supply voltage is 12 to 14V and each lead wire is connected to correct polarity

The red lead is for positive + and the black lead for negative −, with maximum rating of 13.8V ± 15%. The unit is designed for negative ground circuits only.

★ Be sure the unit is properly located

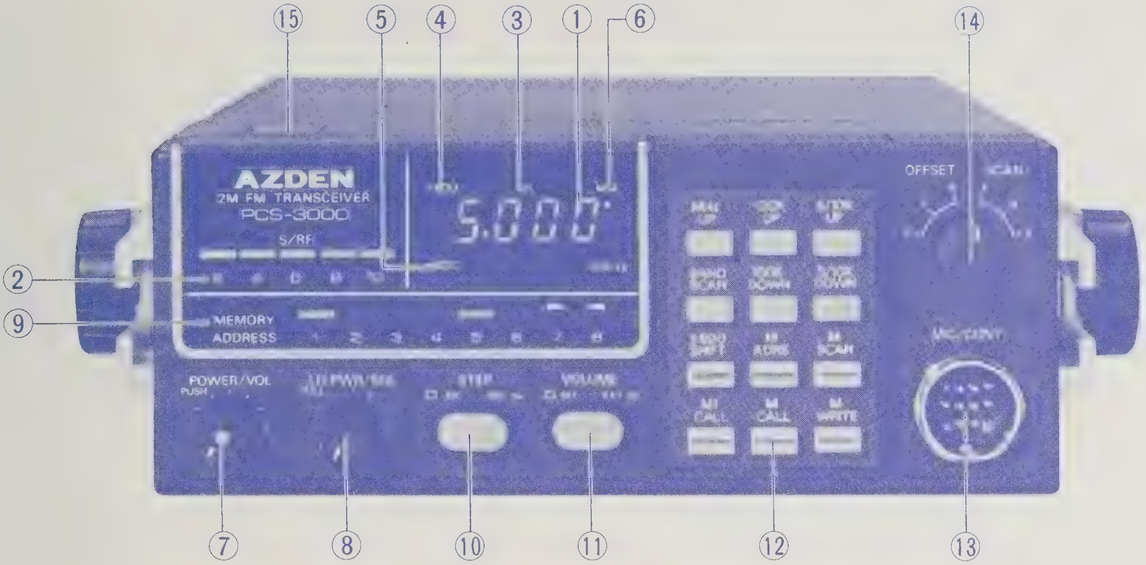
When using this transceiver as a fixed station, it should not be located in a place directly exposed to sunlight or with excessively high humidity.

When using this unit as a mobile station, avoid locating it where it comes in direct contact with the air flow from the vehicle heater. If a vehicle is parked for a long period under the hot sun, the inside temperature becomes very high. Do not start transmitting until the temperature lowers. Since this unit is to be grounded with the negative terminal, it must not be used in a vehicle that is grounded with the positive terminal without taking proper measures for insulation.

★ When detaching or connecting the control head from/to the main unit, be sure to disconnect power

Otherwise the microcomputer may temporarily malfunction. If this happens, see "How to Back Up Memory and Prevent Malfunction." (See page 12.)

NAMES OF COMPONENT PARTS, OPERATION AND USE



(1) Frequency Indicator

This indicator displays the lower four digits of the transmitting or receiving frequency on large LEDs. The example shows 5,000 which are the lower four digits of 145.000 MHz.

(2) Signal Indicator S/RF

This indicator displays the input signal strength during reception and relative output power during transmission using five LEDs. The indicating level will be affected by the SWR of the antenna system. Therefore, 25 watts output does not necessarily mean that all five LEDs must be illuminated.

(3) Unlock Indicator (UL)

If the PLL malfunctions, a colon (:) will light up. The transmitter and receiver will be disabled.

The UL indicator may light up for a short time immediately after power is applied or after a channel change, because the PLL requires a brief instant to lock in. Trouble is indicated only when the UL indicator remains lit for an extended length of time.

(4) +600 kHz Indicator

When transmitting while this indicator is lit, the transmitting frequency is 600 kHz higher than the receiving frequency. Under these conditions, the Frequency Display will show a frequency 600 kHz higher than the receiving frequency while transmitting.

(5) −600 kHz Indicator

When transmitting while this indicator is lit, the transmitting frequency is 600 kHz lower than the receiving frequency. Under these conditions, the Frequency Display will show a frequency 600 kHz lower than the receiving frequency while transmitting.

(6) Memory Mode Indicator

This serves to indicate that the unit is operating under Memory Mode (with M CALL, M1 CALL or M SCAN key depressed). For further details, see the section entitled "Details of Keyboard."

(7) Power Switch/Volume Control

Pushing this switch will turn the power ON and OFF. Rotating it clockwise with the power switch in the ON position will turn up the volume.

(8) Squelch Control/Power Level Switch

The Squelch is used to eliminate background noise under no signal conditions. With this knob turned fully counter-clockwise, the receiver hiss may be offensive. In this case, turn this knob gradually clockwise, and the noise will disappear at a certain point. By setting the knob just beyond this point, the receiver will be silent unless a signal is being received. Rotating the knob further clockwise will reduce the sensitivity of the receiver. Weak signals will then fail to open the Squelch. Pulling this knob toward you will reduce the transmitting output power from 25 watts to 5 watts.

(9) Memory Address Indicator

This unit has eight memory channels. The memory address indicator shows which channel is being used in the memory mode. The content of memory channel 1 can be instantly called (except while transmitting). When memory channel 1 is called, memory address 1 lights up in addition to the memory address of the channel previously used. When transmitting in memory channel 1, only memory address 1 is lit. To return to other channels, push a return key. For further details, refer to "Details of Keyboard" (page 6).

(10) How to Change Scan Step

This unit is capable of scanning from 142,000 to 149,995 MHz in steps of 5 or 10 kHz. Pushing this switch will change the step from 5 to 10 kHz or vice-versa.

(11) Volume Internal/External Select

With this switch, the operator can elect to control the volume either via the front panel or via the microphone.

(12) Keyboard

The keyboard is used to select the operating frequency, memory mode, and scan. The keys are illuminated for easy location in darkness. See "Details of Keyboard" (Page 6).

(13) Control Microphone Connector

This is a 12-pin connector used for connecting the control microphone (standard accessory). For arrangement of pins and their corresponding functions, see page 17. For details of the control microphone PCM-369, refer to page 13.

(14) Offset/Scan Switch

In the three Offset positions (X, Y, Z), scanning is accomplished in the "busy" mode (see below) and the non-standard offsets, as determined by optional crystals, are activated. The U.S. Version is supplied with crystals X=−1.305 MHz and Y=−4.250 MHz. The accessory offset as determined by the offset/scan switch will occur in addition to +600 or −600 kHz offsets, if the latter are activated.

(Free Scan)

Scanning is carried out at a speed of 4 channels per second according to squelch control. When an input signal over the squelch level is received, scanning automatically stops for 5 seconds at a channel receiving a signal.

If a stop key is not pushed within 5 seconds, scanning is automatically resumed.

For information about the stop key, refer to "Details of Keyboard."

Note: With SQL knob rotated fully counter-clockwise, scanning continues at a speed of 4 channels per second.

(Scanning for a Busy Channel)

Scanning is carried out at a speed of 4 channels per second in accordance with squelch control.

When an input signal over the squelch level is received, scanning automatically stops at a channel receiving the input signal until this signal disappears. The frequency stays at this channel for two or three seconds after the signal has disappeared, allowing break-in operation. (If a stop key is not pushed within the break-in time, scanning resumes.) To release scanning, push stop key.

Note: Under no squelching state (with the SQLknob rotated fully counter-clockwise), scanning does not occur regardless of channel status.

(Scanning for a Vacant Channel)

When scanning is carried out in this position under squelching state, it skips over channels that are busy and will automatically stop at the first vacant channel encountered.

Once a signal enters a vacant channel, scanning is resumed until the next vacant channel is encountered.

Note: Under no squelching state (with the SQL knob rotated fully counter-clockwise), scanning will occur regardless of channel status.

Even with this SQL knob turned fully counter-clockwise, however, noise may very rarely enable SQL to activate but this is not mulfunction or breakdown of SQL function.

(15) Tone Switch

When this switch is set to TONE, the PL tone oscillator is activated.

DETAILS OF KEYBOARD

(Details of Keyboard)

The keyboard is designed to keep proper brightness in the light during the daytime and sufficient brightness in the inside of a car at night. Temperature in the control head will rise slightly due to the illuminating lamp, but this will not cause trouble.

● Electronics sound

This transceiver produces an electronic sound with key operation to inform the operator of data entry in the microcomputer.

★ Channel changing (UP-DOWN MODE). . . . . Tuning

- When the 5/10K UP key or the 5/10K DOWN key is pushed once, the operating frequency is moved up or down by 5 or 10 kHz. However, this key will not affect the upper MHz figure.
- For European version, 5/10 UP and 5/10 DOWN key are replaced with 25 UP and 25 DOWN keys respectively.
- When pushing the 100K UP key or the 100K DOWN key once, the operating frequency is moved up or down by 100 KHz. However, this key will not affect the upper MHz figure. Example: Pushing the 100K UP key three times while the unit is operating at 145.800 MHz will change the frequency to 145.100 (5.100 is displayed).
- When pushing the MHz key each time, the topmost figure of the frequency indicator becomes 2, 3, ... , 9, thus changing the channel being used from 142 MHz band to 149 MHz band. However, the 100 kHz and 5 or 10 kHz figures are not changed.

★ Rapid channel change

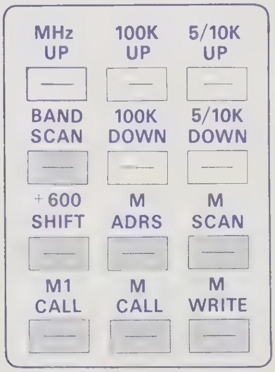
By holding down the 5/10K UP or the 5/10K DOWN key for more than a half-second, the frequency will automatically be moved up or down at a rate of eight channels per second. As the desired frequency is approached, release this key. This key may then be actuated two or three times as necessary to reach the desired frequency.

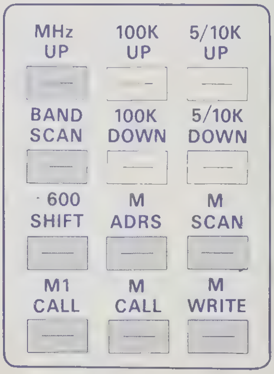
★ How to stop scanning

The 5/10K UP, 5/10K DOWN' 100K UP and 100K DOWN keys are provided with the following functions: Autoscanning, Memory scan stop, and Return from Memory mode.

When scanning is carried out in a specified mode, it will be stopped by pushing one of the above four keys. Actuating the key again will perform the function indicated on its face.

When you push another function key such as M1CALL (used to call the content of M1) while scanning, scanning stops immediately and the frequency indicator displays the content of M1. Thus, you are ready to communicate immediately using this channel.





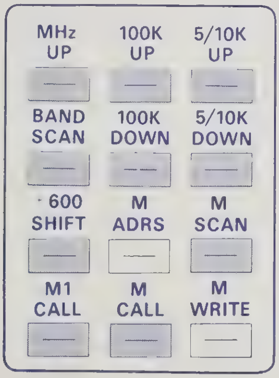
★ How to write in memory

This unit is provided with eight memories M1 to M8.
The M WRITE key is used to store memory. Buy pushing this key, the upper four figures displayed on the frequency indicator (1) can be stored in the memory channel displayed on the memory address indicator. The offset being used at that time will also be stored, so it is not necessary to manually select the offset when the channel is recalled.
The memory address is changed by pushing the M ADRS key.

Example: Store 145.560 MHz in M3.

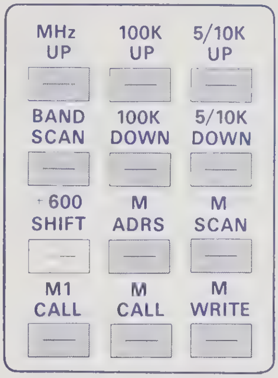
First, obtain 5,560 on the frequency indicator in accordance with procedure for ''Frequency Change '' Second, light up M3 on the memory address indicator by means of the M ADRS key. Then, depress the M WRITE key.
As a result, 145.560 MHz is stored in M3, with an indication of 5.560.

Note: M7 and M8 can be used as a memory similarly to M1 to M6, but they are provided with the following function:
In case of BAND SCAN (automatic scanning), scanning is carried out within the range of frequencies stored in M7 (lower limit frequency) and M8 (upper limit frequency). (See page 9.)



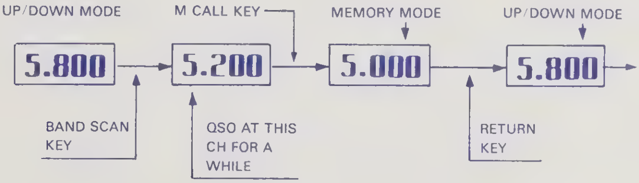
★ ±600 kHz shift

This key is used to determine the transmitting frequency offset. Pushing this key will change the offset to +600 kHz, −600 kHz, and simplex, in this order. For +600 kHz offset, indicator (4) lights up. For −600 kHz offset, indicator (5) lights up. For simplex operation, neither indicator lights up.



★ How to return to frequency which has been used just prior to shifting to memory mode or scanning mode.

Example: First, the unit is operated in the UP/DOWN MODE (e.g. 5.800). Second, memory scanning is undertaken to find an occupied frequency, say 5.200. Then, when a return key is pushed, the frequency returns to 5.800. Return keys include 5/10K UP, 5/10K DOWN, 100K UP and 100K DOWN.
To return to 5.200, press the M CALL key.

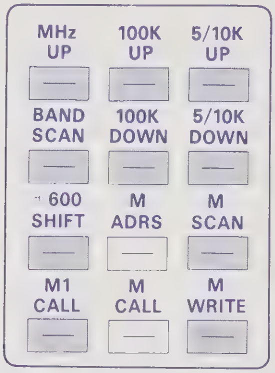


★ Calling memory (A) . . . M ADRS and M CALL

The Memory address key is used to select one frequency from among the eight memory channels stored.

Pushing this key will advance the memory address from 1 to 8 one at a time, lighting the LED of the memory address indicator (9) corresponding to the memory address.

Then, by pushing the M CALL key, the channel stored in the memory is called and displayed on the frequency indicator (1).

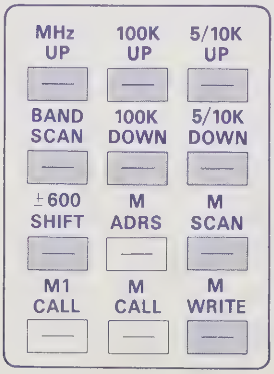


★ Calling memory (B) . . . M CALL, M1 CALL and M ADRS

Once the M CALL or M1 CALL key has been depressed, pushing the memory address key will advance the memory address one at a time, with an indication of the content of each memory. That is, merely pushing the memory address key until the desired memory is reached will call the contents of that memory.

Such state continues until a return key is depressed.

Of course, you may also follow the procedure of "Calling memory (A)."



★ Return from memory mode (see "How to stop scanning"),

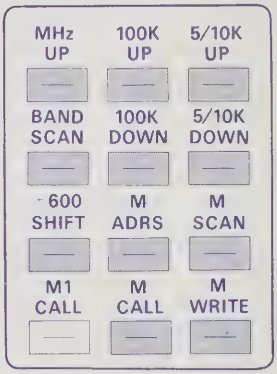
To return to the UP-DOWN mode, push a return key twice. After the key is depressed twice, the channel can be changed by the UP-DOWN operation.

★ Instant memory-1 call ..... M1 CALL

By pushing this key, the content of Memory Channel 1 can be called and indicated at once, independently of the frequency being used at the time or the memory address and scanning.

It is, therefore, very convenient to store a priority frequency in Memory Channel 1. Pushing the M CALL key will immediately call the content of whatever memory address is displayed by the memory address indicator.

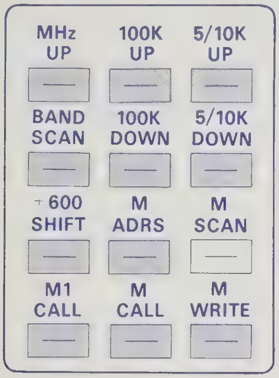
Example: When calling the content of Memory Channel 1 while M3 on the memory address indicator is lit, M1 will also light up. In this case, after one transmission has been made using memory channel 1, address indicator M1 alone is lit.



★ Memory scanning ..... M SCAN

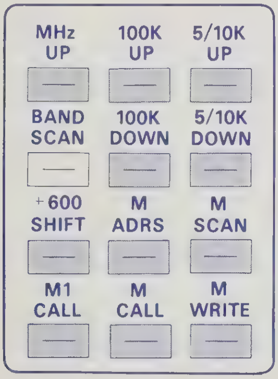
Pushing this key will start scanning of the memory address. Scanning starts directly after the address which is displayed on the memory address indicator.

For example: When M2 is lit, scanning is carried out from M3, M4, M5, M6, M7, M8, M1, M2, . . . in the sequence under a specified mode until a return key (see "How to stop scanning") is pushed.
To start UP-DOWN operation, it is necessary to push the return key twice more. The frequency given by these key operations is the frequency which has been used just prior to shifting to the memory mode.



★ Programmable band scanning . . . BAND SCAN

When pushing this key, scanning begins at the frequency stored in memory 7 (the lower limit frequency of scanning range) in the specified scanning mode (F, B, or V).



When scanning is carried out up to the upper limit frequency (stored in memory address 8), it returns to the frequency stored in memory address 7, repeating until a return key is pushed. For band scan, the frequency stored in memory address 8 should be greater than that in memory address 7, or scanning will not occur.
UP-DOWN operation can be immediately started from the frequency at which scanning has stopped.

★ BAND SCAN – offset

Band scanning can be carried out even in repeater offset mode by storing + or –600KHz in memory address M7 and M8.

Example:
Store 146.100 and +600KHz in M7
Store 146.200 and –600KHz in M8.
Scanning Step = 5KHz

When scanning begins at the frequency stored in M7, frequency indicator displays 6.100 and also +600KHz indicator (4) will light up. Then, it keeps on displaying 6.105, 6.110, 6.115 . . . . up to 6.200 while –600KHz indicator (5) remains lit up, then back to 6.100 with +600KHz indicator lit up, resuming the same scanning as above.

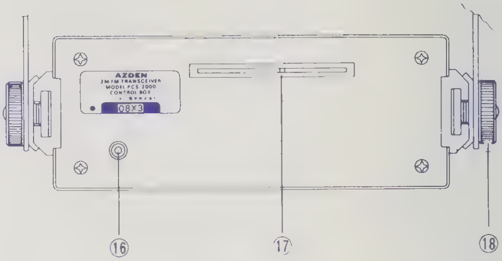
In memory address 7(M7), 6.100 of simplex mode can be stored and + or –600KHz along with upper limit frequency can be stored in M8.

In short, channels (frequencies) just after that stored in M7 always carry offset memory information stored in M8.

★ REAR SIDE OF CONTROL UNIT

(16) External Speaker Jack

An external speaker to be located in any desired position can be connected with this 3.5mm jack. The speaker is activated by setting the speaker output select switch located at the rear of the main unit to the EXT position. This feature is especially convenient when the main unit is located in an out-of-the-way place.



(17) Connecting Board

This edge connector fits into the Control Connector of the main unit. When separating the control unit from the main unit, a remote-control cable (option) must be used.

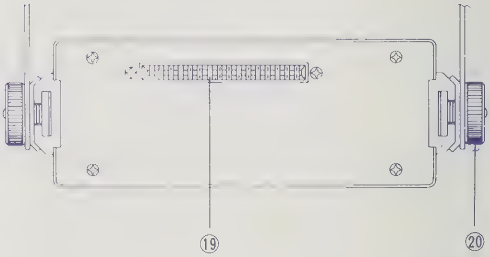
(18) Bracket Support and Screws for Mounting the Control Unit for Mobile Use

★ FRONT SIDE OF MAIN UNIT

(19) Control Connector

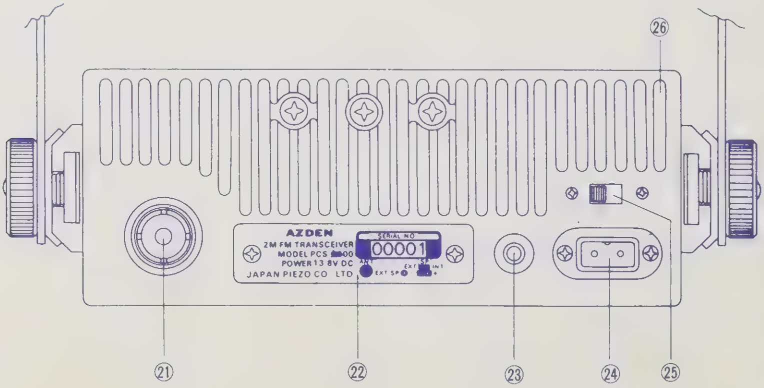
This part connects with the edge connector of the control unit.
When separating the control unit from the main unit, the optional remote cable must be used.

Note: DO NOT REMOVE THE CONTROL HEAD FROM THE MAIN UNIT WHILE THE POWER IS ON.



(20) Hanging Bracket for Mobile Unit

★ REAR SIDE OF MAIN UNIT



(21) Antenna Connector

The antenna connector is an SO239 type designed to mate with a PL259 connector. The impedance of the antenna and cable used should be 50 ohms. Some degree of mismatch is tolerable, but a severe mismatch will reduce the power output of the PCS 3000. The feedline length should be kept as short as possible to minimize power dissipation.

(22) Name Plate

(23) External Speaker Jack

An external speaker (option with 3.5mm plug) is connected with this jack. With the speaker output select switch in the INT position the internal speaker is activated. When it is set to the EXT position, speaker output is supplied to the speaker jack (16) on the rear side of the control unit.

By inserting the speaker cable plug into this jack with the select switch to INT, the internal speaker is automatically disconnected.

(24) Power Connector

The PCS-3000 is to be supplied with 13.8V ± 15% at 5A or more. The red lead of the power cord is positive and the black is negative (ground).

When connecting the power cord to the power supply, be careful not to reverse the polarity.

Should the polarity be connected incorrectly, a 10A fuse will blow to protect the main unit. Never use a fuse other than the specified one.

(25) Speaker Output Select Switch

See (16) and (23).

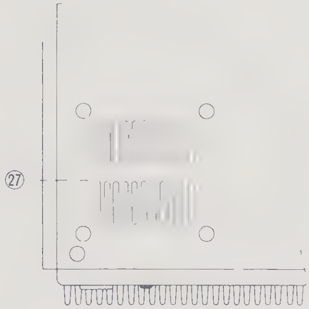
(26) Heat Sink

The heat sink is made of die-cast aluminum for sufficient capacity for prolonged transmission at 25W output.

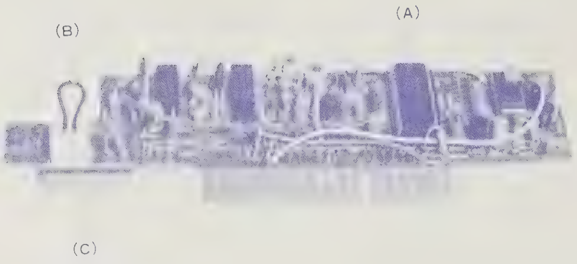
★ BOTTOM OF MAIN UNIT

(27) Internal Speaker

Since the sound holes face downward, the main unit should be located so as not to block these holes. The speaker is 8 ohms impedance.



★ HOW TO BACK UP MICROCOMPUTER MEMORY AND HOW TO CHARGE BATTERY



A C-MOS microcomputer (A) is employed in this unit. To take advantage of the power-saving characteristics of C-MOS, this unit is provided with a nickel-cadmium battery (B). It serves to back up the memory by the user.

The nickel-cadmium battery has been fully charged before it leaves our factory, so that no recharging is required for six months. However, after this unit has been stocked or displayed in the shop for a long period of time, the battery must be recharged.

After once charged, it is automatically charged each time the unit is operated. The battery is serviceable for more than three years in usual operating conditions.

● Method of initial charge (Generally, the battery will not require initial charge):

Remove the top cover of control unit and carefully detach the 4P connector equipped with loop lead (C).

Insert the 4P connector (supplied) equipped with red and black leads (Im) in place of the detached connector, and connect the red lead with the plus terminal of 13.8V power supply or a battery (12V) and black lead with the minus terminal, thereby starting to charge the battery.

Desirable charging time is 12 to 15 hours. However, the battery can be used for backing up the microcomputer memory by quick charge (5 to 6 hours).

After charging the battery, remove the charging connector in reverse order from above.

Turn on the power switch and insert the 4P connector with loop lead while checking that "5.000" is displayed.

If charged with the polarity reversed, the nickel-cadmium battery will be damaged.

While the unit is operated, the battery is automatically supplied with a current (1/15 of usual charging current) for recharging.

Note: Be sure to turn OFF the power switch of the control head in case of charging.

● How to back up memory and how to prevent malfunction:

The content of memory stored by the user is backed up by the nickel-cadmium battery. However, if the transceiver unit and the control unit are detached or combined with the power applied by mistake, the microcomputer or memory may sometimes malfunction.

Note: When the transceiver unit and the control unit are detached or combined, be sure to turn OFF the power switch of the control unit.

If the microcomputer or memory malfunctions due to the abovementioned cause, take the following steps:

(1) Turn off the power supply.
(2) Remove the top cover of the control unit.
(3) Remove the 4P connector (C) with loop lead.
(4) Turn on the power supply.
(5) Check that the content of every memory is 5.000, with a display of "5.000".

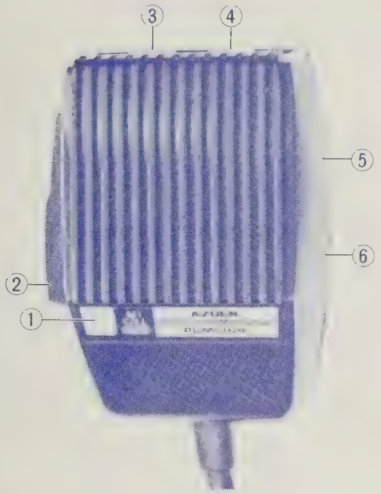
After checking this state, insert the 4P connector with loop lead, with the power applied (where "5.000" is displayed).

Then, store your desired frequency in the memory.

MICROPHONE PCM-369

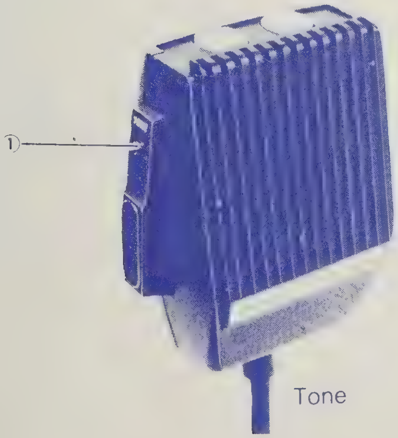
A multifunctional microphone is provided as a standard accessory. Your own radio microphone can be used for this transceiver using an optional microphone connector.

(1) M1 CALL (USA version)



The M1 CALL button has the same function as the M1 CALL key of the control unit. Refer to "Details of Keyboard."
This facilitates quick and easy recall of the contents of memory channel 1.

(1) Tone CALL Key (European version)



The unit incorporates the 1750 Hz oscillation circuit. You can activate the circuit by pressing (1) button and this enables the unit to transmit the carrier frequency modulated by 1750 Hz for repeater operation. Thus, you can start QSOing by pressing the PTT lever in a specified period of time.

(2) Push to Talk Switch Lever

Pushing this lever puts the unit in the transmit mode. Speak at a normal level while bringing the microphone near your mouth. Releasing the lever will return unit to the receive mode.

(3) 5/10K UP Key and (4) 5/10K DOWN Key

These keys have the same function as the 5/10K UP key and the 5/10K DOWN keys of the control unit. By holding these keys down, each MHz range can be scanned, just as is the case with the front panel control keys.

(5) VOL VOLUME

(Refer to control unit (11)).
When the Volume Internal/External Select Switch is set to EXT Position, speaker sound volume can be controlled with this knob.

(6) Channel Lock Switch

Moving this slide switch down will immobilize the keyboard of the control unit and the UP and DOWN keys of the microphone, thus stopping all key operations.
The channel being used is secured even if you touch a key by accident in mobile use.
Moving this switch upward will release the locked condition.

When any operating frequency is locked in a ±600 kHz offset mode, transmitting and receiving frequency remain offset. This allows monitoring of repeater input frquency.

OPERATION

● Reception

● Before activating the unit with the power switch, set the knobs and switches of the control unit as follows, and check that the antenna is connected correctly:

VOL	Turned fully counter-clockwise
SQL	Truned fully counter-clockwise
HIGH/LOW	HIGH
VOL INT/EXT	Internal/external to internal ("UP position")
SCANMODE	F

● Firmly plug the microphone connector into the microphone jack on the unit.

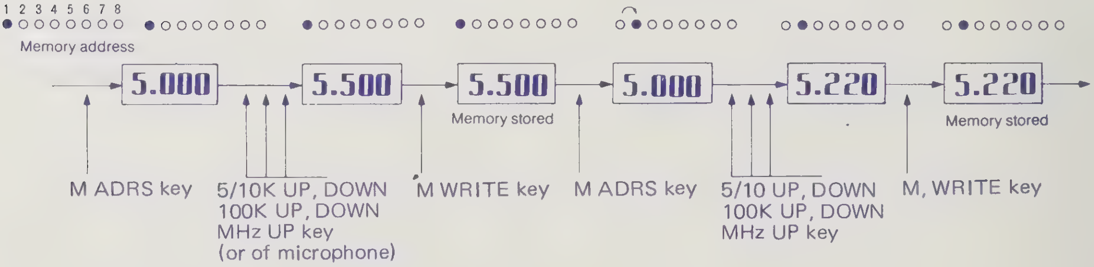
● Set the speaker output select on the rear side of the main unit to INT position.

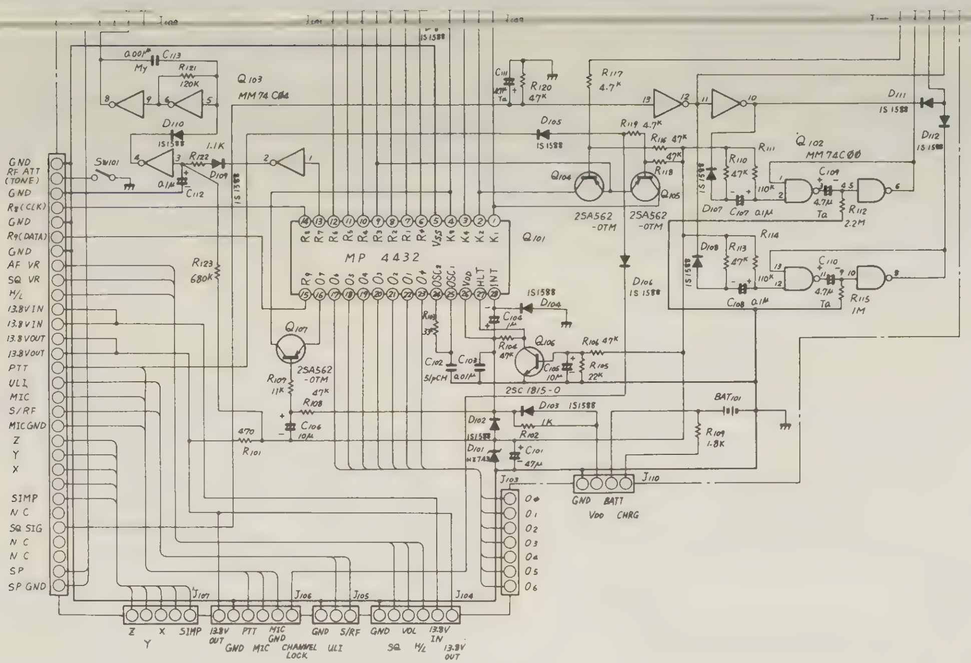
● Turn on the power switch. With no power connected to the radio, it is impossible to tell whether the power switch is on or off; however, the power connector may be attached without harm to the unit if the power switch is on.

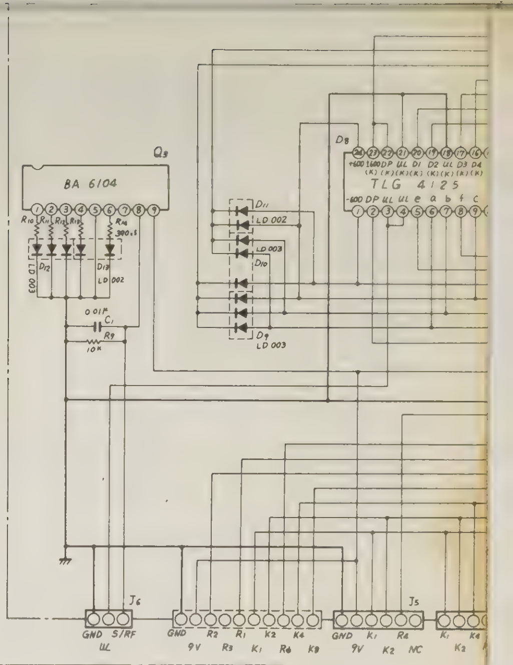
● How to program the memory

Suppose you want to write the following frequencies in the memory: M1, 5.500; M2, 5.220; M3, 5.330; M4, 5.440; M5, 5.550; M6, 5.660, M7, 5.700; M8, 5.990.

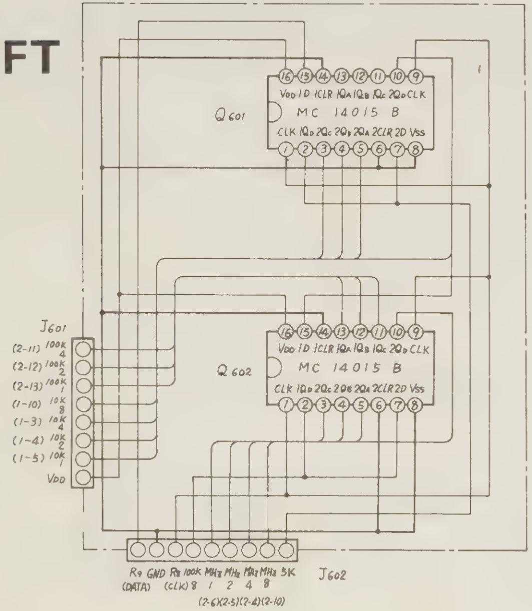
(1) Assume that 5.000 is stored in all memories.
(2) Push Memory Address key.
(3) Push Memory Address key until memory address LED indicates memory Channel 1.
(4) Dial 5.500 by means of the keybboard.
(5) Push Memory WRITE. Thus, 145.500 MHz has been written into memory No. 1.
(6) Push Memory Address to Advance Memory Address to Channel 2.
(7) Dial up 5.220 by means of the front panel keyboard.
(8) Push Memory WRITE key. This enters the frequency 145.220 into Memory Channel 2.
(9) Repeat the process for the appropriate frequencies for Channels 3 through 8.



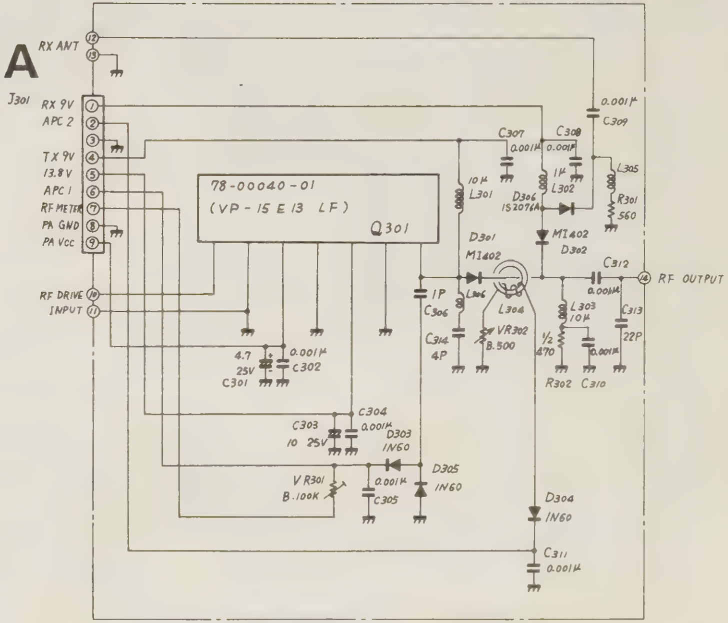

GND
RF ATT (TONE)
GND
R8 (CLK)
GND
R9 (DATA)
GND
AF VR
SQ VR
H/L
13.8V IN
13.8V IN
13.8V OUT
13.8V OUT
PTT
ULI
MIC
S/RF
MIC GND
Z
Y
X
SIMP
N C
SQ SIG
N C
N C
SP
SP GND
SW101
Q103 MM74C04
Q102 MM74C00
Q101 MP 4432
Q104 2SA562-OTM
Q105 2SA562-OTM
Q107 2SA562-OTM
Q106 2SC1815-O
BAT101
J103
J104
J105
J106
J107
J110
GND BATT VDD CHRG
O0 O1 O2 O3 O4 O5 O6
Z X SIMP Y
13.8V OUT GND PTT MIC MIC GND CHANNEL LOCK ULI
GND S/RF
GND VOL SQ H/L 13.8V IN 13.8V OUT


Q3
BA 6104
D8
TLG 4125
D9 LD 003
D10
D11 LD 002
D12 LD 003
D13 LD 002
C1 0.01μ
R9 10K
J6
J5
GND S/RF UL
GND 9V R2 R3 R1 K1 K2 R6 K4 K8
GND 9V K1 K2 R4 NC
K1 K2 K4

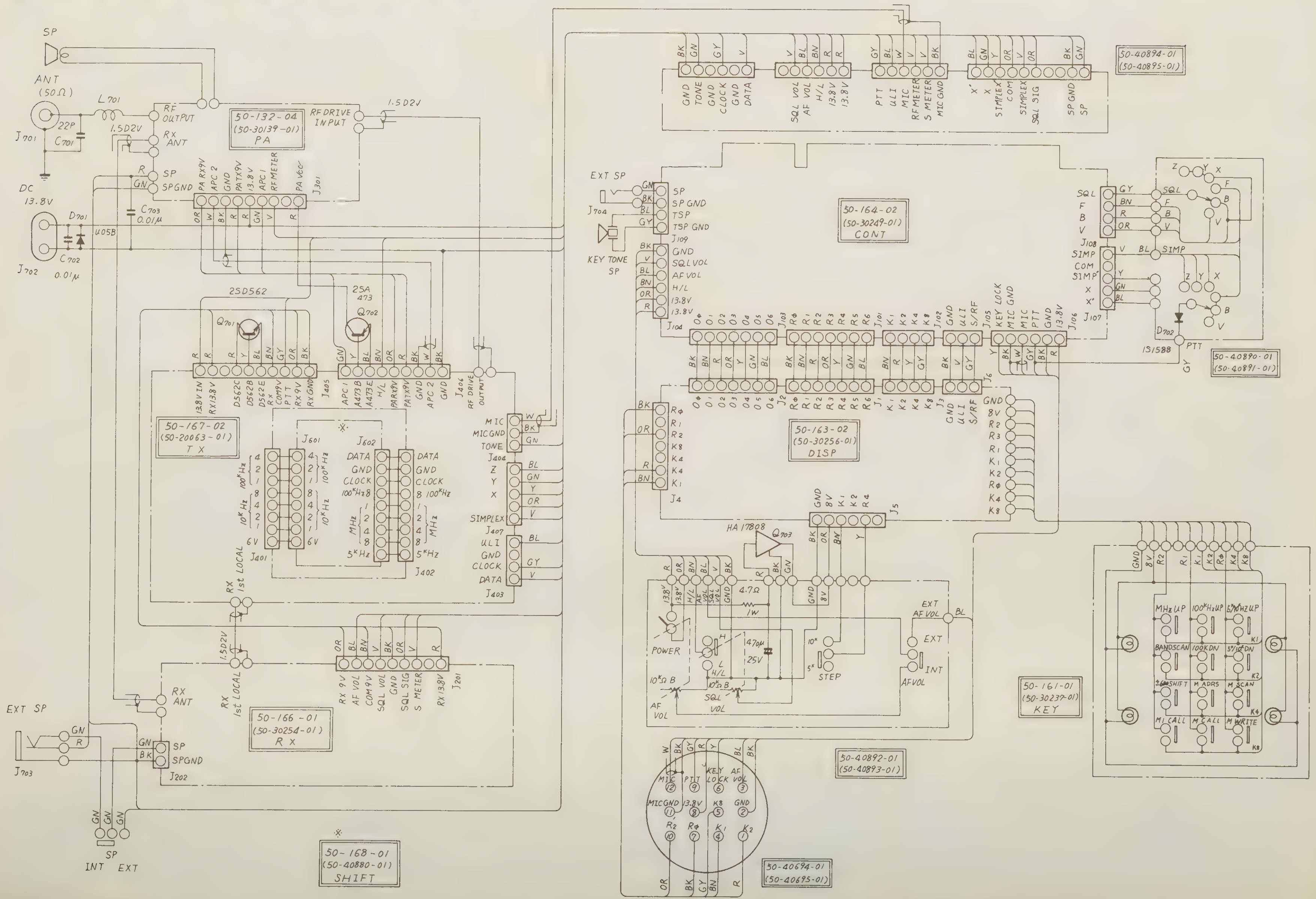
SHIFT


Q601
MC 14015 B
Q602
MC 14015 B
VDD 1D 1CLR 1QA 1QB 1QC 2QD CLK
CLK 1QD 2QC 2QB 2QA 2CLR 2D VSS
J601
(2-11) 100K 4
(2-12) 100K 2
(2-13) 100K 1
(1-10) 10K 8
(1-3) 10K 4
(1-4) 10K 2
(1-5) 10K 1
VDD
J602
R9 (DATA) GND R8 (CLK) 100K 8 MHz 1 MHz 2 MHz 4 MHz 8 5K
(2-6)(2-5)(2-4)(2-10)

PA

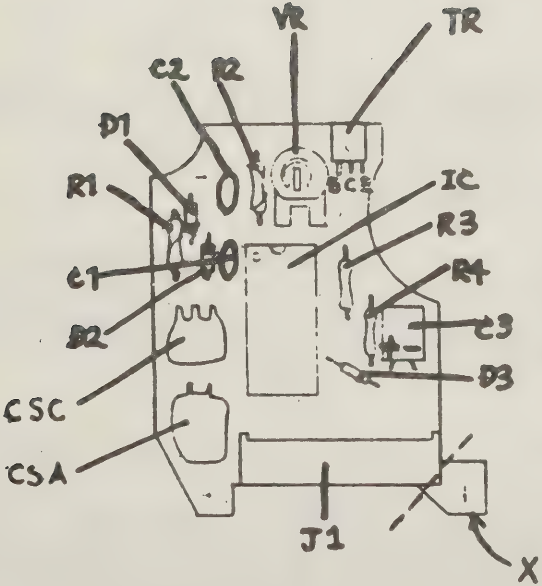

RX ANT
J301
RX 9V
APC 2
TX 9V
13.8V
APC 1
RF METER
PA GND
PA Vcc
RF DRIVE INPUT
78-00040-01
(VP-15E13 LF)
Q301
RF OUTPUT
C301 4.7 25V
C302 0.001μ
C303 10 25V
C304 0.001μ
C305 0.001μ
C306 1P
C307 0.001μ
C308 0.001μ
C309 0.001μ
C310 0.001μ
C311 0.001μ
C312 0.001μ
C313 22P
C314 4P
L301 10μ
L302 1μ
L303 10μ
L304
L305
L306
D301 M1402
D302 M1402
D303 1N60
D304 1N60
D305 1N60
D306 1S2076A
R301 560
R302 1/2 470
VR301 B.100K
VR302 B.500

AZDEN®



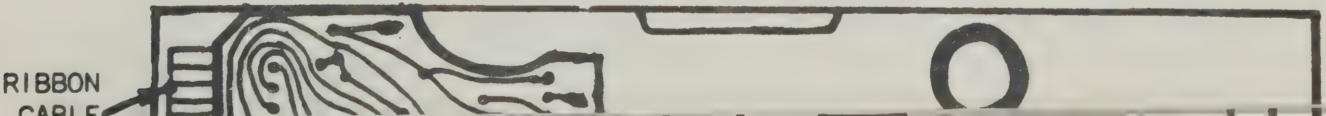
CONT

DISP



IC: MK5087N
TR: 2SC1815
CSA: CSA 3.58 MHz
CSC: CSC
R1: 1K 1/8 W
R2: 47K
R3: 10K
R4: 100K
C1: 0.01 uF
C2: 0.01 uF
C3: 33 uF 10 V
D1: 1S1588
D2: HZ6A3
D3: 1S1588
J: 8-pin Connector
VR: 5K potentiometer

FIGURE 1. COMPONENT PLACEMENT ON PC BOARD, VIEWED COMPONENT SIDE UP



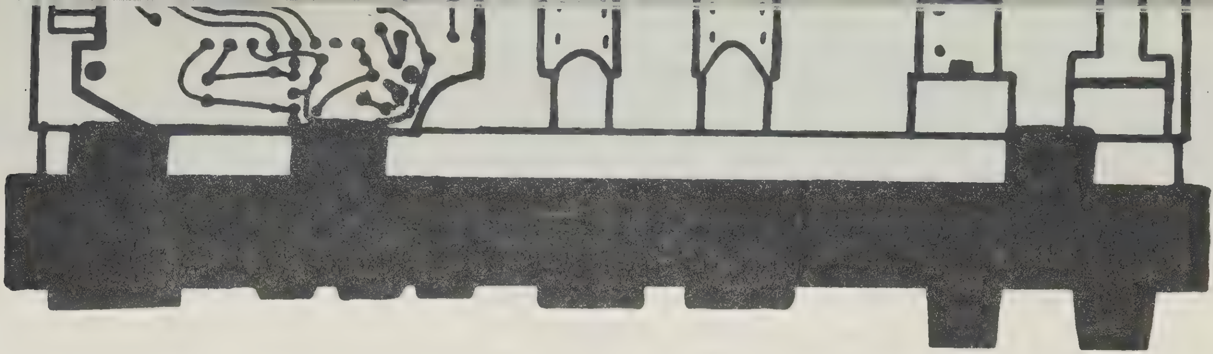


FIGURE 2. LOCATION OF TOUCH-TONE PC BOARD INSIDE CONTROL HEAD OF PCS-3000

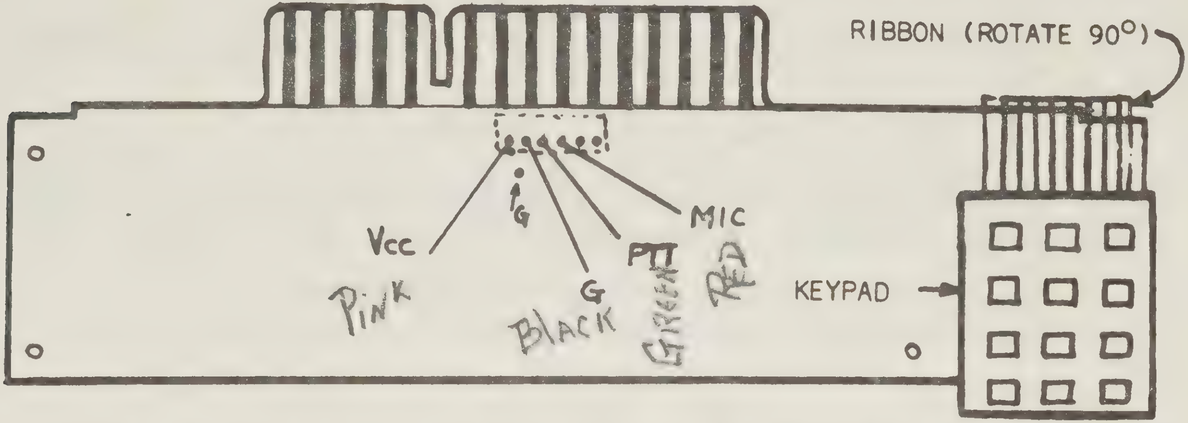


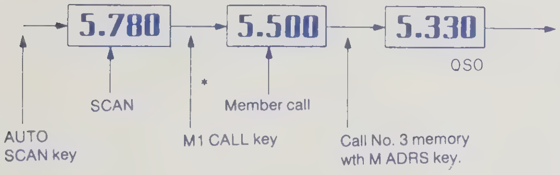
FIGURE 3. WIRING POINTS TO CONTROL BOARD, TOP OF CONTROL HEAD OF PCS-3000

How to use M1 CALL, M ADRS and M CALL keys

Pushing M1 CALL key while operating the unit will immediately call the contents of Memory Channel 1 independently of reception mode.

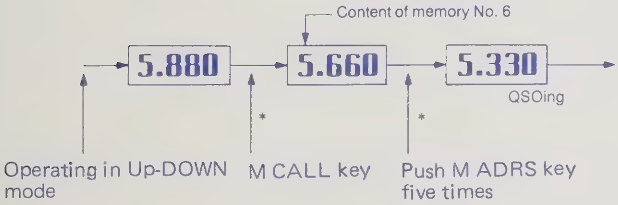
Example 1: Assume that 5.500 is stored in Memory Channel 1 and 5.330 is stored in Memory Channel 3.

Call them according to the procedure illustrated below. These memories can be alternately called by pushing the M1 CALL key and M CALL key, when M3 is lit in advance by means of the Memory Address key.



Example 2: Call Memory Channel 3 from among ordinary channels.

Assume that 5.660 is displayed and Memory Address indicator shows Memory No.6. The procedure is illustrated below.



How to use MEMORY SCAN key

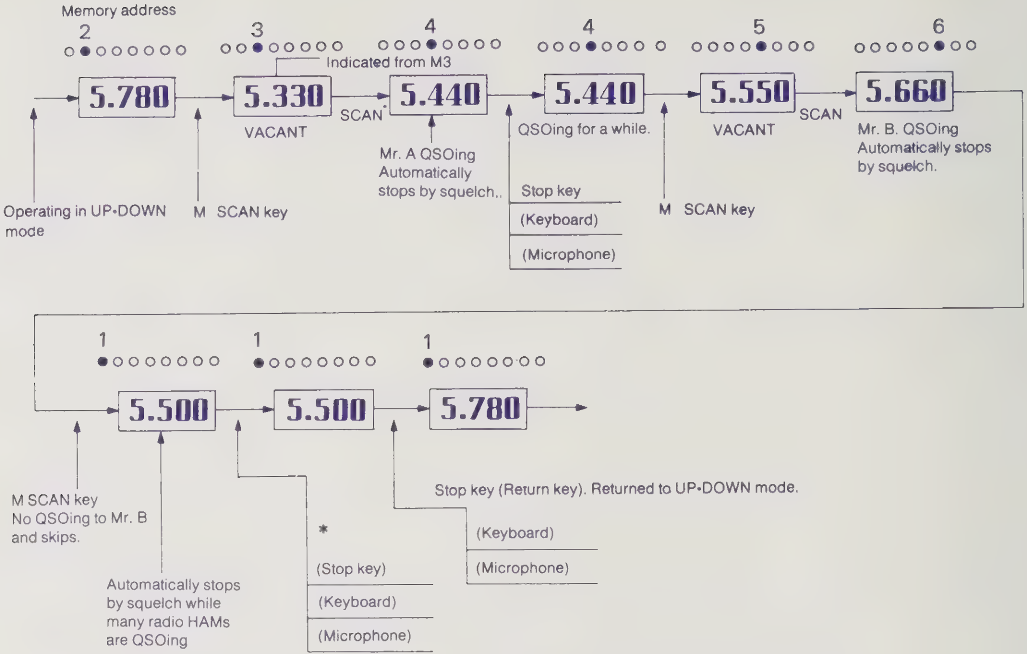
Example:

(1) Rotate SQL knob clockwise to set at squelching state.

(2) Set SCAN knob at B (BUSY).

(3) M4 is being used by Mr. A and M6 is being used by Mr. B.

(4) Suppose that the memory channels are programmed as follows: M1, 5.500; M2, 5.220; M3, 5.330; M4, 5.440; M5, 5.550; M6, 5.660; M7, 5,700; M8, 5.990. Suppose that M2 address indicator is lit. The procedure is illustrated below.


Memory address
2
5.780
Operating in UP•DOWN mode
M SCAN key
3
5.330
VACANT
Indicated from M3
SCAN
4
5.440
Mr. A QSOing Automatically stops by squelch..
4
5.440
QSOing for a while.
Stop key
(Keyboard)
(Microphone)
5
5.550
VACANT
M SCAN key
SCAN
6
5.660
Mr. B. QSOing Automatically stops by squelch.
1
5.500
M SCAN key No QSOing to Mr. B and skips.
Automatically stops by squelch while many radio HAMs are QSOing
1
5.500
*
(Stop key)
(Keyboard)
(Microphone)
1
5.780
Stop key (Return key). Returned to UP•DOWN mode.
(Keyboard)
(Microphone)

* Pushing M SCAN key at this step will repeat M2, M3 ••••••

● How to use BAND SCAN key

Example 1: Set the OFFSET/SCAN switch to B (Busy). Scanning will begin when the BAND SCAN key is pushed. Be sure the squelch is closed.

Assume 5.700 is stored in memory channel 7 and 5.990 is stored in memory channel 8. Also, assume that the frequency increment has been set to 10 kHz.

The unit will begin scanning at 5.700, then move to 5.710, 5.720, and so on until it reaches 5.990. Then it will return to 5.700 and continue until a signal is encountered or until the squelch is opened. (See page 9.)

★ HOW TO MAKE YOUR OWN CONTROL BOX

The connector of control microphone for this unit is supplied with a portion of the input-output matrix circuit of the microcomputer. The circuit diagram for the available signals is shown below. You can make a variety of your own control boxes using these signals in combination with optional control microphone connector plug (with cord).

Lead wires corresponding to signals:

1. Green (K2)
2. Red GROUND
3. Blue AF VOL
4. Yellow (K1)
5. Purple (K8)
6. Grey KEY LOCK
7. Black (RO)
8. White (13.8V)
9. Brown PTT
10. Orange (R2)
11. Knit MIC GROUND
12. Pink MIC OUTPUT

Signal 5K UP by contacting R0 to K1
Signal 5K DOWN by contacting R0 to K2
Signal M1 CALL by contacting R2 to K8
Signal MHz UP by contacting R2 to K1
Signal BAND SCAN by contacting R2 to K2
Signal M WRITE by contacting R0 to K8

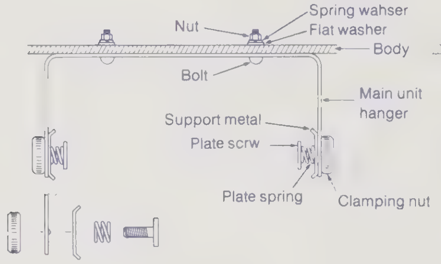
PTT and VOL can be added to the above.

★ HOW TO MOUNT HANGER BRACKET OF MAIN UNIT AND CONTROL UNIT

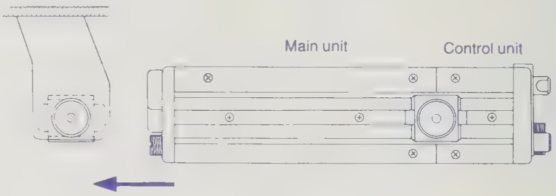
How to mount main unit

Fit plate screw, plate spring and support metal to hanger vertically or horizontally, and tighten them temporarily with a clamping nut. Push the main unit in direction of the arrow and fix it at a proper position. Then, firmly tighten the clamping nut.

①

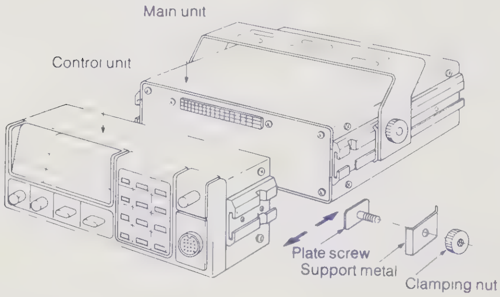


②



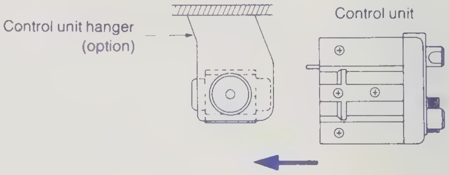
How to remove the control unit

Loosen the clamping nut, remove the plate screw, plate spring and support metal connecting the main unit with the control unit. Then, separate the two units.



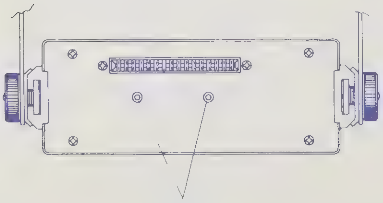
How to mount the control unit

Mount the control unit on the hanger bracket in the same way as with the main unit.

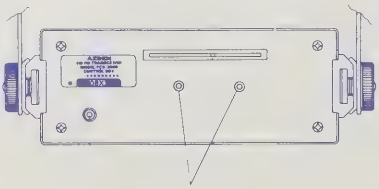


How to install cable connector

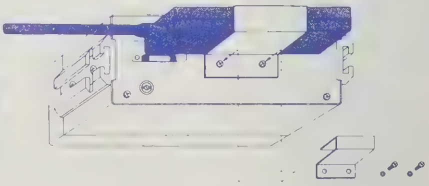
The optional parts ECK-90 kit contains a remote cable, hanger, connector holder and screws. Fix the connector holder to two screw holes (A) on the front of the main unit and to two screw holes (B) on the rear of the control unit using a screw M3 x 5 (standard accessory) and a spring washer for M3 illustrated in (C).



(A)



(B)



(C)

OPTIONAL PARTS

Control microphone connector plug with cord: EC-80

This unit is supplied with a multifunctional microphone as a standard accessory. Additional Connectors are available.

Remote cable kit: ECK-91

Using the remote cable kit, the control unit can be located by itself in the desired place. For instance, if it is inconvenient to stretch your arm to the lower part of the dashboard, you can place the control unit in a visible location and the main unit under the rider's seat. The cable length is 15 feet (5m).

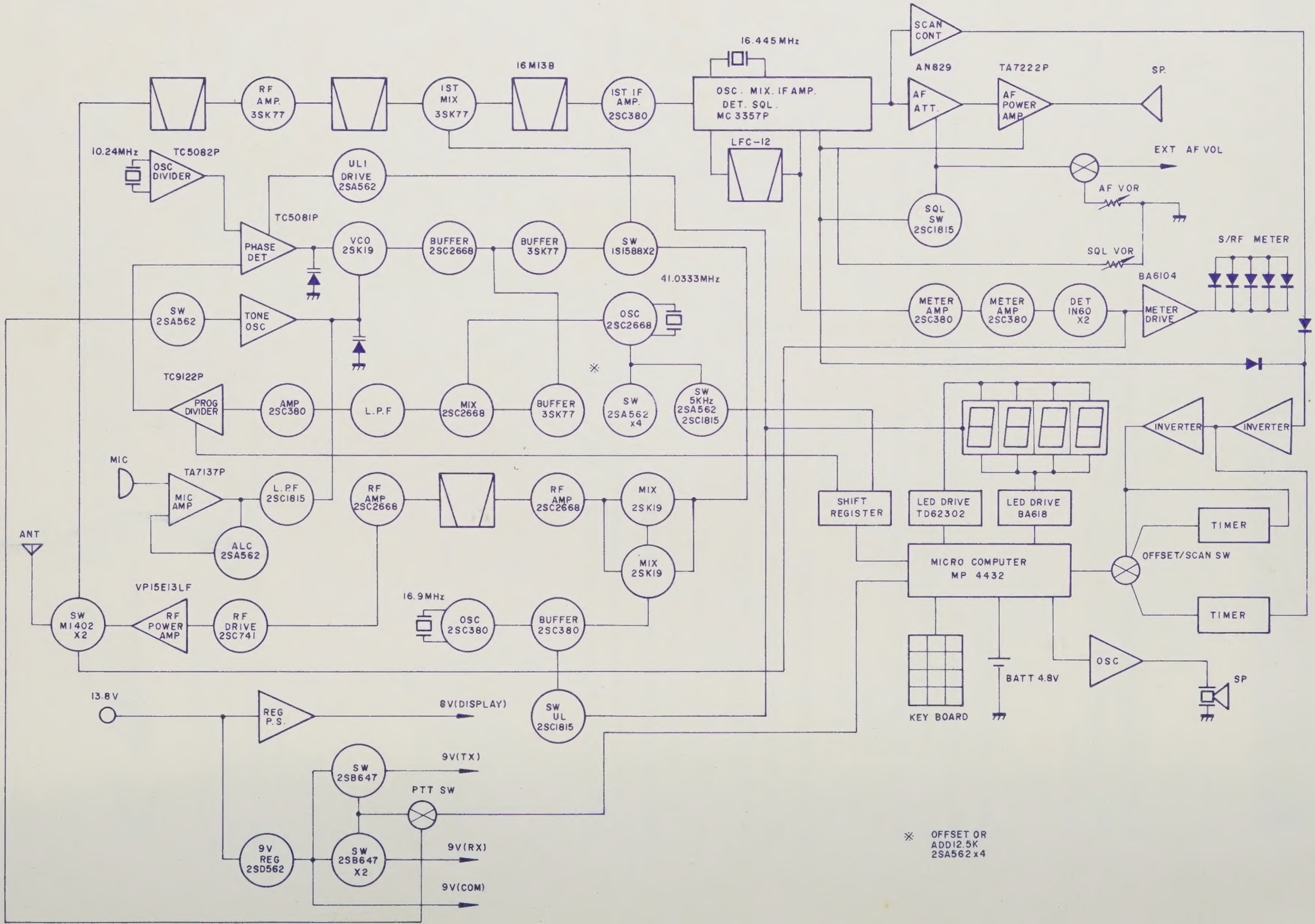
External speaker kit AS-006

This accessory is ideal when you wish to get more audible output. It is also useful if you wish to change the location of the speaker. The speaker is provided with a 6 foot (2m) cord with 3.5mm plug.

Base station microphone DX-2000

This is our highest quality dynamic microphone for use with fixed stations. It features a built-in amplifier, UP-DOWN function, memory 1 call, PTT lever, and locking mechanism.

★ BLOCK DIAGRAM



※ OFFSET OR
ADD12.5K
2SA562x4

★ SPECIFICATIONS

(General specifications)

● Semiconductors	IC 18 psc. (including MICON 1) FET 7 pcs. Tr 36 pcs. Di 61 pcs.
● Frequency band	142.000 to 149.995 MHz (USA) 144.000 to 145.9875 MHz (Europe)
● Operating ambient temperature range	−10°C to +50°C
● Power supply voltage	13.8V ±15%
● Grounding polarity	Minus
● Current consumption	0.7A max. for reception 5.0A max. for transmission

(Transmitter)

● Transmitting output	25W (HIGH) 5W (LOW)
● Modulation method	Variable reactance frequency modulation
● Maximum frequency deviation	±5 KHz
● Spurious	Better than −60 dB with respect to fundamental
● Antenna impedance	50Ω
● Type of emission	F3
● Microphone used	500Ω dynamic type
● Tone frequency	USA: 100 Hz, ±0.5KHz deviation variable Europe: 1750 Hz, ±5KHz deviation

(Receiver)

● Receiving system	Double superheterodyne system
● Intermediate frequency	First: 16.90MHz Second: 455kHz
● Receiving sensitivity	0.19μV(144～148MHz) (12dB SINAD) RF input: 1μV or less for 30dB S/N
● Selectivity	±6kHz or more at 6dB down ±15kHz or less at 60dB down
● Audio output	2W or more (8Ω load and 10% distortion)

(Dimensions and Weight)

● Dimensions	62(H)x158(W)x 246(D) mm (except projections)
● Weight	Approx. 2.5kg

*Notice: Specifications are subject to change without notice for further technical improvement.

★ LIST OF ACCESSORIES

(1) Microphone PCM-369	1
(2) Microphone hanger	1
Set screw	2
Flat washer for above	2
(3) DC power cord (with fuse) 1.5m	1
(4) Spare fuse (10A)	2
(5) Hanger and fixtures	1 set
Hanger	1
Clamping nut	2
Plate screw	2
Spring for above	2
Support metal	with hole 2 (without hole)
Set screw	4
Flat washer for above	4

AZDEN

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